

## INFLAMMATION OF APPENDICES EPI- LOICÆ AND INTESTINAL DIVER- TICULA.\*

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**O**F THE frequency with which the fatty appendages of the large bowel are the seat of inflammatory processes of sufficient severity to warrant description, little can be said because of the paucity of reported cases. That the appendices epiploicæ may be the seat of isolated foci of infection from intestinal diverticula has been known for some time, but the fact has been of interest chiefly to the pathologist. The matter has real clinical significance, however, since there is found therein an explanation otherwise wanting of the occurrence of certain inflammatory conditions within the abdomen.

The two following cases may be taken as typical:

George A., Syrian, aged 35, was seen by the writer in September, 1903, in consultation with Dr. Riley of San Francisco. He then gave the following history: He had been troubled for several years with constipation, but otherwise had had generally good health. Six months ago he had an attack of abdominal pain, lasting a few days, accompanied by nausea. For the last six months he has not been well, having had a great deal of discomfort in the abdomen, and having suffered with obstinate constipation and loss of appetite. He lost twenty pounds or so in weight, and was generally miserable. Three weeks ago he had a sudden attack of severe abdominal pain, chiefly in the left side.

This history of recurring attacks of colic, with nausea and some fever, was very much that of a chronic appendicitis of mild degree, and the findings, on examination, presented an apparently typical picture of left-sided appendicitis. There was slight fever, rapid pulse, marked tenderness and rigidity of the left hypogastrium, and considerable distention. By dint of frequently applied enemata the lower bowel was emptied, when a tumor the size of a walnut became evident. It was situated a little above Poupart's ligament on the left side; was hard, irregular in outline, and fixed to the posterior wall of the iliac fossa. The tumor was quite tender to the touch, but there was no other tender point in the abdomen.

The diagnosis lay between a tumor of the intestine, with perforation, or at least ulceration, causing inflammatory symptoms, a so-called left-sided appendicitis and inflammation of one of the appendices epiploicæ. Carcinoma of the colon seemed improbable from the age of the patient, the generally good health, the early fixity of the tumor, the marked inflammatory symptoms in recurrent attacks. A left-sided appendicitis is apt to present some inflammatory mass palpable through the rectum, and more or less tenderness in the region of the head of the cecum, and pain referred at least in the beginning to the navel. These symptoms were absent in this case, so it seemed probable that the tumor was an inflamed appendix epiploica as described by Hansmann, Glaser and others.

On September 5th, under chloroform, an incision was made parallel to Poupart's ligament, corresponding to the ordinary incision for appendicitis. The tumor was found to be connected with the colon and adherent to the iliac peritoneum, from which it was separated much as one would separate an inflamed appendix vermiformis similarly adherent. When lifted out of the incision it was seen to consist of an appendix epiploica, which was greatly enlarged, was black though not gangrenous, and adherent to adjacent portions of the colon. When these adhesions to the colon were freed the pedicle, which was very small, was ligated, and the mass removed. Because of the inflammation present and the evidently damaged condition of the bowel wall at the site of the pedicle, the stump was buried by a row of fine silk sutures and a neighboring appendix epiploica anchored over the suture line. No macroscopical connection of the interior of the inflamed mass with the interior of the bowel was made out, but the suture was intended to close any small communication which might be present. The bowel was returned to the abdomen and the wound closed. The wound healed under one dressing, but as soon as the patient was put upon solid food he was again troubled with distention with gas, the result of imperfect digestion, due to hyperchlorhydria. The patient was much more comfortable on a proteid diet. By recent report the patient is greatly improved in general health, there has been no return of the inflammatory attacks, and the constipation is less troublesome.

The second case is similar. Mrs. T. G., age 55, Swiss, patient of Dr. Gibson of Bolinas. She is the mother of ten children, has always been a strong, hard-working woman, and until comparatively recently has enjoyed uniformly good health. For several years, however, she has been obstinately constipated. She would have the desire to go to stool, and would strain with disproportionately small result. She was finally obliged to resort

to the use of high enemata with a long colon tube. Cathartics were effective only in large dosage. She further complained of frequent attacks of annoying pain in the abdomen, colicky in character but not of great severity. The pain was generally more marked on the left side.

On examination (February, 1904) she presented the following condition: Short but very fat woman, past middle life; abdomen pendulous; definite though not great tenderness in left iliac fossa; some muscular resistance in left hypogastrium, but no definite tumor palpable from in front; perineum torn and very lax; marked rectocele, cystocele and procidentia; laceration of cervix; ovaries palpable but small; on left side high up a tumor mass of the size of a hen's egg attached to pelvic wall, but not to uterus or ovary.

Under chloroform anterior colporrhaphy, trachelorrhaphy and perineorrhaphy were performed and the abdomen opened. The ovaries and tubes were normal. The tumor felt from below proved to be an inflammatory mass connected with the pelvic colon and adherent to the peritoneum about the brim of the pelvis. The mass was loosened, brought out through the incision, and found to consist of inflammatory material containing a greatly enlarged appendix epiploica. On cutting across the pedicle a small opening was found leading into the interior of the intestine. This opening was closed with fine silk, and the abdomen closed. Recovery was uneventful.

The cause of such isolated foci of inflammation in the appendices epiploicæ is in most, if not all, cases the formation of minute diverticula in the wall of the intestine, which were shown by Klebs, Hanseman and others to occur at the points where the blood vessels traverse the muscular coats of the bowel to reach the mucous membrane. In a paper before the German Surgical Congress of 1899 Graser, of Erlangen, reported the finding of a large number of such so-called false diverticula at autopsy in a case of cardiac insufficiency in which there was great venous stasis in the abdominal vessels. Graser thought he saw in the venous stasis the cause of the dilatation of the orifices in the muscles through which the vessels pass, and looked upon the straining at stool as the exciting cause of the projection of the mucous membrane through the muscle. Hanseman, however, and one of his students disputed the suggested influence of the venous stasis, and called attention to the observation that these diverticula are much more common in fat intestines, the vessels in the muscular wall being surrounded by considerable deposits of fat, making weak places in the wall through which intra-intestinal pressure of gas and feces would drive minute pockets of the mucous membrane.

Given even minute diverticula with intact mucous membrane the pockets are apt to be filled with more or less inspissated feces, which by pressure cause necrosis of the lining epithelium and open the way for infecting micro-organisms to pass out into the connective tissue of the bowel wall, causing more or less widespread inflammation. Such inflammation may lead to a mild degree of local peritonitis, resulting in adhesions or, as is more frequently the case, the infection may travel along the blood vessels and find its way into neighboring appendices epiploicæ. These false diverticula are, therefore, apt to be bottle-shaped, with wide fundus and narrow neck. Hanseman has reported as many as 400 such diverticula in a single intestine. They are far more frequent in the sigmoid flexure than elsewhere in the bowel, although they have been found in the transverse and ascending colon, as well as the rectum.

In the first case here reported the diverticulum, if present, was too small to be seen with the naked eye. The presence in that case of marked inflammation, with hemorrhage and fat necrosis in the appendix epiploica, suggests that after the invading bacteria once get through the mucous membrane they travel along the blood vessels in the open connective tissue spaces into the appendices, or by a process of thrombosis cause a localized phlebitis, with consequences similar to phlebitis elsewhere.

From a clinical standpoint it is of interest to note that the inflammatory processes induced by these diverticula are generally of mild degree, and rarely comparable to rapid cases of appendicitis. Still the

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resemblance to appendicitis proper is in cases so great that such an inflamed appendix epiploica has been removed, the surgeon believing he was removing the appendix vermiformis. Hansemann has shown that these diverticula are not always so innocent, but may become the means of causing tension necrosis and serious peritonitis. It is further evident that the adhesions set up by such inflammatory processes may result in anchoring the bowel, interfering with its function, and may form bands beneath which the intestine may be caught and strangulated.

The diagnosis is not always to be made; i. e., a differential diagnosis from certain forms of appendicitis from some other inflammatory tumors and from new growths of the bowel wall. A history of recurrent attacks of inflammation on the left side without tenderness over the base of the appendix vermiformis; a history of chronic and severe constipation, the formation of a tender tumor in the left iliac fossa would strongly suggest an infection of this character. The common tumor in the wall of the large bowel is the adeno-carcinoma which contracts and causes an annular constriction of the bowel. The symptoms here are those of carcinoma of the internal layers, but if the tumor be of slow growth there may be no symptoms beyond those consequent upon a gradually increasing obstruction. If the carcinoma is low down, it is apt to impress its form on the fecal mass, and in turn to be lacerated by the passage of large masses, resulting in slight bleeding.

Even if in a given case an anatomical diagnosis cannot be made with certainty, the symptoms are apt to be sufficiently definite to furnish the indications for operative treatment.

Of the treatment little need be said, as it is evident that operative removal of the mass, with repair of the bowel, is the only rational procedure in the severe cases as a matter of necessity; in the mild cases, for the removal of adhesions and dangerous bands and the prevention of future serious trouble. The relief of the chronic constipation, which plays so prominent a role in the etiology, is not less important as a prophylactic measure.

## THE CONSERVATIVE TREATMENT OF ACUTE APPENDICITIS.\*

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THE SUBJECT of appendicitis has been more thoroughly discussed by medical men and the laity during the past decade than any other medical topic. Regardless of this, there still remains a wide difference of opinion in the treatment, and a grave mortality, which is evidence that we have not thoroughly mastered the subject. The disease is far more prevalent than is generally supposed. Observers have found on postmortem examinations that from 30 to 40 per cent give evidence of having had appendicitis during life.

In bringing this subject before you it is not that I have anything new to offer, but to make an appeal to be more conservative in the time you select to operate.

The disease of the appendix has been observed by many writers during the past century, but it was not accepted by the medical profession until 1836, when Dr. Fritz of Boston convinced them that most of the cases of peritonitis were caused by appendicitis.

The appendix is located in the right iliac fossa, and seldom wanders from that location. It is attached to the lower end and back part of the cecum, and is very similar in structure, except that it is poorly developed on account of not having any special function, and a poor blood supply. Its location corresponds to a point about two inches from the anterior superior spine of the ilium directed to the umbilicus, known as McBurney's point.

The causes of appendicitis have varied to suit the opinions of different authors, from foreign materials to a meat diet. The most rational cause is that of defective drainage from mechanical obstruction, or pre-existing disease, which leaves the appendix in an unhealthy condition, and makes a proper soil for the bacillus coli communis, or some pus infection, which, under ordinary conditions, would be harmless. Typhoid fever, dysentery, indigestion and many other diseases may act in preparing the way for the germ which is always associated with the disease. Appendicitis is generally divided into various classifications which simply represent different stages of the disease, whether it be catarrhal, suppurative or gangrenous.

The symptoms of acute appendicitis are of such marked character that any one who has had any experience with the disease should readily make a diagnosis. The four cardinal symptoms—pain, tenderness, gastro-intestinal disturbance and rigidity of the muscles—in conjunction with the constitutional symptoms, will be of great value. The pain is generally acute, and first felt in the region of the umbilicus, and radiating over the entire abdomen. After the pain lasts a few hours it becomes more fixed in the region of the appendix, and the tenderness soon becomes localized here. The disease is often ushered in by vomiting, which consists of the food in the stomach, and later the secretions from the upper part of the intestinal tract. The rigidity of the abdominal muscles over the appendix is a very valuable symptom, not only in making out the diagnosis, but differentiates it from other abdominal lesions. The pulse and temperature are valuable signals as to the condition of the patient, but only in conjunction with the cardinal symptoms are they valuable in arriving at a diagnosis.

The leukocytosis is of importance in conjunction with the other symptoms in not only arriving at a diagnosis, but differentiates it from other diseases, as typhoid fever. It is of much value in indicating the severity of the disease. J. Da Costa (1) claims when it reaches 20,000 or more that pus has formed, and requires immediate operation. I believe that 20,000 or more does not only indicate that pus has formed, but, in conjunction with other symptoms, that it has passed beyond the confines of the appendix, and we have an effusion into the peritoneal cavity, and is one of the symptoms that not only confirms the diagnosis, but should deter the surgeon from operation so long as the count remains above 20,000. The pulse remaining above 116 and the other symptoms exaggerated are special indications that operation should be postponed until the general condition is better. This is the hopeless class of patients which give the ever-ready surgeon his mortality. The surgeon generally says he will give the patient the last chance (operation), which is too often true.

Operation at this stage will generally find the pus free in the peritoneal cavity. You may succeed in removing the ruptured or gangrenous appendix, but not the infection, as it is now a constitutional sepsis, and not local. The infection has not only spread over the abdominal cavity, but the operation produces trauma of the peritoneum and omentum, which are the life preservers of the abdominal cavity, and it inhibits their action in antagonizing the infection, to say nothing of the depressing effect of the anesthetic.

Many of our best medical men and surgeons, as Osler, Deaver, Price and Murphy, have considered appendicitis a surgical disease at all stages, and have recommended operation as soon as diagnosed, regardless of the stage. I believe such teaching as this has and is doing a great injustice. Many physicians under unfavorable circumstances, and without the proper amount of experience, and often at the time the case becomes very serious, will operate, because they have been led to believe that surgery offers the only hope

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